Industrial Sites

. . .a Success Story

Technology is not the only way Industrial Sites activities can be streamlined and save money. Available resources are also used in a variety of new ways. Below are just some of the examples of recent cost savings that took place at an Industrial Sites project on the Tonopah Test Range:

Members of the 820th Red Horse Squadron install C-4 plastic explosives, using a non-electric firing train and detonation cord, during the demolition of unexploded ordnance at Antelope Lake on the Tonopah Test Range.

- Due to a large amount of process knowledge, the Industrial Sites team requested and received permission from the state to prepare only two of the normal four documents needed to adequately characterize and close a site (SAFER see page 2)
- Construction debris was disposed at the Tonopah Test Range construction landfill instead of being trucked to the Nevada Test Site
- The Industrial Sites team conducted simultaneous remediation activities at different sites with similar contaminants of concern, resulting in reduced mobilization and demobilization costs
- Unexploded ordnances were detonated by U.S. Air Force personnel, which eliminated a task from the U.S. Department of Energy's remediation scope of work and reduced the overall cost of the project to the U.S. Department of Energy

Path Forward

The ultimate goal of the Industrial Sites project is to complete all corrective actions and ensure that any necessary long-term surveillance and maintenance programs are in place to protect the safety of the public and the environment. The Industrial Sites Project is scheduled to be completed by 2008.

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Environmental Restoration

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History and Background

The Environmental Management (EM) Program was established in 1989 at U.S. Department of Energy (DOE) offices around the country to address the environmental liabilities associated with more than 50 years of nuclear weapons production and testing. More than ten years later, EM is the world's largest environmental cleanup effort. As part of that effort, the DOE Nevada Site Office is responsible for remediating portions of the Nevada Test Site, the Tonopah Test Range on the Nevada Test and Training Range (also known as the Nellis Air Force Range), and eight off-site locations around the country. Cleanup activities include identifying the nature and extent of contamination; determining its potential risk to the public and environment; and performing the necessary corrective actions in compliance with guidelines and requirements.

President John F. Kennedy exiting R-MAD during a tour of the Nevada Test Site

The Nevada Test Site and the Tonopah Test Range played important roles in the advancement of the nation's nuclear testing program by functioning like small towns with a variety of facilities such as gas stations, motor pools, worker housing, and research buildings. Portions of the facilities and land were used in direct support of nuclear testing, which resulted in some environmental contamination and subsequent hazardous and radioactive waste generation. These sites are collectively known as Industrial Sites and require varying types of remediation and/or cleanup.

Over 1,700 Industrial Sites have been identified, verified, and inventoried for characterization, closure and/or restoration. Of these, more than 900 sites have been formally closed. The remaining sites have been grouped according to the source of contamination, location, and other technical characteristics.

Corrective Action Site (CAS)

Site that has been identified as needing remediation. These sites can include everything from a simple vehicle battery to entire buildings.

Corrective Action Unit (CAU)

A CAU is a grouping of CASs that are similar in remediation technique, type of contaminates or proximity to each other.

Approach to Cleanup

To ensure compliance with the Federal Facilities Agreement and Consent Order, a specific cleanup method is chosen to remediate an industrial site after characterization has been performed and a plan of action approved. The three methods of cleanup are:

Housekeeping

Housekeeping activities consist of closing each CAS by removing debris and/or material, disposing of generated waste, and verifying that

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each site is clean. The site is then closed by visual inspection and/or laboratory analysis of soil verification samples.

Complex Closure

Sites requiring a greater level of precaution are considered Complex Closure sites. These sites may include septic tanks, sewage lagoons, landfills, mud pits, or even facilities previously used in testing and support activities. As a result, these sites may be more complex to remediate than a site containing a discarded vehicle battery. The Complex Closure approach includes the following steps:

- Corrective Action Investigation Plan
- Site Investigation
- Corrective Action Decision Document
- Corrective Action Plan
- Plan Implementation
- Closure Report

FFACO

The Federal Facility Agreement and Consent Order (FFACO) is a 1996 agreement between the state of Nevada Division of Environmental Protection, DOE and the U.S. Department of Defense. The FFACO outlines a schedule of cleanup and monitoring commitments for sites contaminated by DOE and U.S. Department of Defense activities, and requires the State's approval of remediation activities. Once the State has approved closure, a public notice of completion is issued to mark the end of the closure process.

Streamlined Approach for Environmental Restoration (SAFER)

For sites to qualify for the SAFER process they must have a significant amount of existing process knowledge (knowing how the facility was contaminated) and sampling data already in place. This process bypasses portions of the Complex Closure approach including the Corrective Action Plan, Corrective Action Investigation Plan, and Correction Action Decision Document. In this approach, a SAFER plan is prepared, the corrective action is implemented, and a closure report is completed. An example of this could be a building that has detailed historical documentation. In this case, remediation crews know what to expect in terms of contaminants at the site and how to properly remediate them.

Regardless of the method of remediation selected, CAUs are placed within one of twelve source groups which are organizational categories intended for the grouping of CAUs by site type. Examples of types of sites grouped are tunnel muckpiles and inactive ponds, drains and sumps, disposal wells, inactive tanks, contaminated waste sites, septic tanks and lagoons, spill sites and Deactivation and Decommissioning facilities.

Deactivation and Decommissioning

Facilities that have no current or future mission often employ the Deactivation and Decommissioning (D&D) closure process. D&D CAUs use characterization and remediation techniques that are slightly different than those used at other sites. The sites generally implement swipe sampling, decontamination, dismantlement, and other related activities. Despite these differences, the process that will be used to reach closure at D&D facilities will follow one of the standard Federal Facility Agreement and Consent Order processes previously described as either Complex or SAFER.

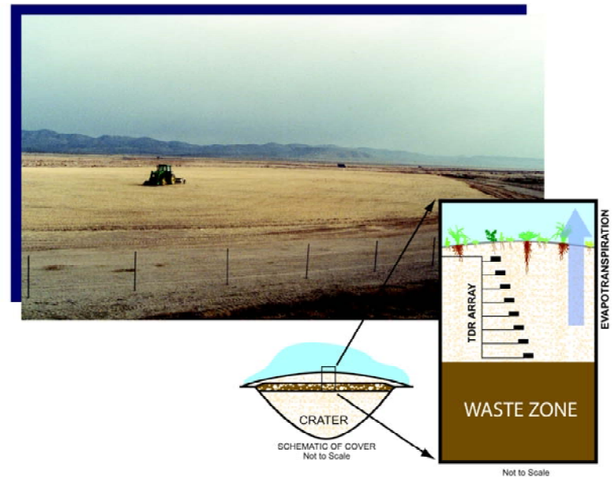
While contaminated soil is the most common waste produced at Industrial Sites, contaminated building debris and equipment is prevalent at D&D sites. There are a total of eight D&D facilities. They are: Pluto, Super Kukla Facility, Reactor Maintenance, Assembly and Disassembly (R-MAD) Facility, Engine Maintenance, Assembly and Disassembly (E-MAD), Test Cell A, Test Cell C, Jr. Hot Cell, and U.S. Environmental Protection Agency (EPA) Farm. To date, we have closed three facilities R-MAD, Jr. Hot Cell, and EPA Farm. The next facilities scheduled for D&D are Test Cell A and Test Cell C.

What is Deactivation and Decommissioning?

Deactivation is the process of placing radiologically or chemically hazardous facilities into a safe and stable condition for interim storage prior to decommissioning and dismantling. The goal of deactivation is to reduce risks to the workers, public and environment, and limit the long-term cost of surveillance and maintenance. Decommissioning simply means to remove from service which, in most cases at D&D sites, means to demolish the facilities and properly dispose of the generated waste.

Better, Cheaper, Faster

The Industrial Sites Project is always looking for new and innovative technologies to improve the cleanup process, reduce cost, and expedite remediation. Two such technologies that have been employed are an alternative landfill cover and the Hydraulic Shears.



This is an example of one type of alternative landfill cover used for an arid site.

An alternative landfill cover was designed to cover and close a mixed low-level waste disposal cell at the Nevada Test Site. Traditional landfill covers are not appropriate in this region due to the arid conditions at the Nevada Test Site. Therefore, project planners took on the challenge and developed an innovative approach that received approval from the state of Nevada Division of Environmental Protection and also meets the requirements of the Resource Conservation and Recovery Act (RCRA). Using data and engineering specifications from a DOE program that demonstrated alternative landfill covers, the project team decided upon a solution known as an "ET" (evapotranspiration) cover that was a top performer in arid conditions. The ET cover consists of a compacted soil barrier layer topped with a layer of native vegetation. The process of plant transpiration (i.e., movement of moisture through a plant from the roots to the atmosphere) facilitates evaporation of moisture from the disposal unit. Another key element of the design is the use of time-domain reflectometry sensors to measure soil-water content. Using this innovative approach, the mixed low-level waste disposal site is now closed. The best news of all is that an effective solution has been employed with a multimillion dollar savings to the taxpayer.

Another technology, the Hydraulic Shears, was used at a Nevada Test Site facility which housed two 500,000 gallon tanks that stored gasoline and diesel fuel. The Industrial Sites Project was tasked with demolishing the tanks after they were deemed inactive with no plans for future use. For the Industrial Sites crew, the size of the job was not the only matter of concern. Safety was also a key issue. The workers handling the fuel tanks had to take extra precautions to prepare for potential fuel leaks or fuel contamination in the soil beneath the tanks. The use of hydraulic shears helped crews conduct the work safely, and enabled workers to remotely dismantle equipment and facilities, such as piping, pumps, and fill stands associated with the tanks. Not only did the hydraulic shears decrease the potential for worker exposure to any potential contaminants, they effectively expedited the task at hand. By using efficient technology and practical recycling techniques, the Industrial Sites team successfully completed yet another corrective action site ahead of schedule and under budget.

Hydraulic shears demolishing a 500,000 gallon fuel tank at the Nevada Test Site Area 23 tank farm.

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